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ABSTRACT

A survey was conducted among senior high schools in Wisconsin which were reported to be offering courses in the conservation of natural resources. Seventy-two questionnaires were mailed to teachers identified by administrators as "conservation teachers". Questionnaires returned provided data on fifty-two teachers and 2,681 students. Data reported relate to the academic preparation of teachers, other courses taught by teachers, student ability levels, course organization in the schools, topics covered, reading materials used, use of field sites, field trips, and individual student field activities, and types of written assignments. The discussion of the data points up many inadequacies in the programs; and relevance to the students involved. Recommendations are made for improvement. (EB)

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THE STATUS OF WISCONSIN HIGH SCHOOL CONSERVATION COURSES

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In 1935 the Wisconsin Legislature adopted laws requiring all public elementary and secondary schools and all teacher training institutions to offer "adequate instruction" in the conservation of natural resources. The State Superintendent of Public Instruction, the Dean of the College of Agriculture of the State University and the State Conservation Commission were assigned responsibility for developing courses of study for use in secondary schools and teacher training institutions.

Laws were also passed requiring "adequate instruction" in the conservation of natural resources for those requesting certification and licensing to teach science or social studies.

Eligibility for state financial aid was tied to compliance with these laws.

In the mid- and late-1940's, Stevens Point State Teachers College (now Wisconsin State University-Stevens Point) anticipating a demand for teachers so trained, developed an undergraduate major program in conservation education.

As a result of this activity, the number of conservation courses in Wisconsin senior high schools began to grow.

A study of such courses was conducted by the author during the 1967-68 school year and repeated, with modifications, during the 1968-69 school year. This paper summarizes the results of the latter study.

The 1968-69 Study

A survey was conducted among public senior high schools which, according to official reports submitted to the State Superintendent of Public Instruction, were offering a course in the conservation of natural resources.

A survey questionnaire was mailed to each individual identified by a school district administrator as a teacher of a course in the conservation of natural resources and to the "conservation teacher" in those schools where a course in the conservation of natural resources was listed but the name of the person teaching it was omitted. Seventy-two questionnaires were mailed to conservation teachers; sixty-two were completed and returned.

Tabulation of the responses to the questions on the questionnaire disclosed that thirteen of those individuals identified by school district administrators as teachers of a course in the conservation of natural resources were in reality teaching conservation in other high school courses, not in a separate conservation course. The courses identified by these teachers included biology, vocational agriculture, geography, general science and American Problems. One individual was a director of a school forest.

In addition, three of the courses were being offered at the junior high school level. Data from these reports is not included in this summary.

I. Teacher Data

A. Undergraduate Major

Field	No. of Teachers
Agriculture Economics	1
Agriculture Education	16
Biology	9
Biology-Agriculture Education	2
Biology-Chemistry	1
Biology-Conservation Education	6
Biology-Geology	1
Biology-Social Science	1
Conservation Education	2
General Science	1
Geography-Geology	2
Natural Science	2
Industrial Arts	1
Social Science	3
Wildlife Management	1
No Response	3
Total Number of Teachers	52

B. Graduate Major

Field	No. of Teachers
Agriculture Education	11
Agronomy	1
Biology Education	5
Biology-Chemistry	1
Counseling	1
Ecology	2
Education	2
Educational Administration	2
Outdoor Education	1
Science Education	2

C. Courses Taught in Addition to Conservation of Natural Resources

Title	No. of Teachers	Title	No. of Teachers
Administration	1	Horticulture	2
Advanced Biology	2	Industrial Arts	1
Agriculture Education	18	Introductory Biology	20
Agriculture Engineering	1	Mathematics	2
Chemistry	1	None (Conservation Only)	1
Cooperative Marketing	1	Outdoor Education	2
Counseling	1	Physical Science	5
Dairy Science	1	Physiology	1
Drivers Education	1	Reading	1
Forest Management	2	Small Engines	1
General Science	4	Soil Science	1
Geology	1	Welding	1
Health	2	World Geography	1
History	2	No Response	2

II. Student Data

D. Number of Students Enrolled

Course Length	No. of Students (approximate)
One Semester	1,445
Two Semesters	1,236
Total	2,681

Total State Public Senior High School Enrollment 1968-69 - 296,834

E. Student Ability Level

Level	No. of Schools Responding
Low	5
Average	9
High	1
Low-Average	10
Mixed	21

III. Course Data

F. Length in Semesters

One Semester -- 17 Schools

Two Semesters -- 29 Schools

G. Teacher-Student Contact Minutes Per Week

No. of Minutes	No. of Schools Responding	No. of Minutes	No. of Schools Responding
120	1	260	3
130	1	265	1
150	1	270	2
210	1	275	17
220	1	280	1
230	3	290	1
240	1	300	1
250	11		

H. Number of Sections

No. of Sections	No. of Schools Responding	No. of Sections	No. of Schools Responding
1	23	5	0
2	9	6	2
3	9	7	1
4	2		

I. Course Grade Level

Grade	No. of Schools Responding	Grade	No. of Schools Responding
9	1 (slow)	9-12	6
11	2	10-11	2
12	5	10-12	15
		11-12	15

J. Graduation Requirement

Yes -- 1 School No -- 44 Schools NR -- 1 School

IV. Curriculum Data

K. Availability of Syllabus

Response	No. of Teachers Responding	
Yes	28*	Text Outline -- 3
No	14	
NR	1	

*Only 14 were able to supply a copy.

L. Reading Materials Used

No. of Schools Using	Title
11	Allen, Conserving Our Natural Resources
2	Allen, Wildlife Legacy
3	Allen, An Introduction to Forestry
3	Bates, The Forest and The Sea
3	Buchsbaum, Basic Ecology
1	Burt & Grossenheider, Field Guide to Mammals
5	Cheyney, This Is Our Land
2	Clepper, Careers in Conservation
1	Clepper, World of The Forest
5	Dasman, Environmental Conservation
3	Elliott, Conserving America's Resources
3	Foster, Approved Practices in Soil Conservation
2	Gabrielson, Wildlife Conservation
4	Guise, The Management of Farm Woodlands
7	Knuti, et. al., Profitable Soil Management
7	Leopold, Sand County Almanac
1	Life-Time (Publishers), Ecology
23	McNall, Our Natural Resources
18	Parsons, Conserving America's Resources
1	Petrides, Field Guide to Trees and Shrubs
1	Peterson, Field Guide to the Birds
1	Rand McNally (Publisher), BSCS Green Version, High School Biology

L. (cont'd)

No. of Schools Using	Title
3	Singer (Publisher), Man Improves His World
4	Smith (Editor), Conservation of Natural Resources
4	Storer, Web of Life
1	USDI, Man, An Endangered Species
3	Whitaker, American Resources
1	Zim, Fishes
1	Zim, Gamebirds
1	Zim, Mammals
1	Zim, Trees
1	Zimmerman, Introduction to World Resources
35	Mimeographed or Duplicated Materials
22	Natural Resources of Wisconsin, (Reprint from 1964 Wisconsin Bluebook)
32	Pamphlets from Governmental Agencies (SCS, DNR, USFS, etc.)
1	Reading Wisconsin's Landscape
16	USDA Yearbooks
37	Wisconsin Conservation Bulletin
6	Miscellaneous

M. Types of Field Sites Used

No. of Schools Using	Type of Field Site
1	Cemetery
7	City and County Parks
10	Conservation Education Center, Poynette
17	Farm
12	Fish Hatchery
30	Forest or Woodlot
0	Forest Genetics Laboratory
1	Forest Research Station
4	Game Farm (Other than Poynette)
3	Game Preserves
5	National Forest Sites
16	Open Fields or Prairies
10	Paper Mill
8	Power Plant
1	Private Formal Gardens
6	Public Hunting Ground
11	Ranger Station
4	Reservoir
4	Sawmill
30	School Forest or School Outdoor Area
10	Sewage Disposal Plant
4	State Park

M. (cont'd)

No. of Schools Using	Type of Field Site
6	Water Purification Plant
1	Watershed Structure
9	Wetlands

N. Annual Number of Field Trips

No. of Trips	No. of Schools Responding	No. of Trips	No. of Schools Responding
0	5	6	7
1	1	10-15	1
2	5	12	2
3	7	30-35	3
4	7	4-6 Weeks Outdoors	1
5	6	Many	1

O. Limitations on Field Trips

Teacher Statement	No. of Schools Responding
Class Size	5
Distance	4
None Available	1
Transportation (expense)	11
Teaching Load	3
Schedule Conflicts	29
School Policy Limitation	5
Weather	2
No Limitations	3

P. Individual Student Field Activities

Some -- 35 Schools None -- 10 Schools NR -- 1 School

Kind of Activity	No. of Schools Responding
Bird House and Feeder Building	2
Community Interviews	1
Deer Yard Surveys	1
4-H Work	3
Fish Ponds	1
General Field Studies	3
Leaf Collections	1
Local Conservation Club	3
Pollution Inventories	3
Pheasant Raising	3
Soil Conservation Practices	2
Stream Improvement	6
Timber Stand Improvement	3
Tree Planting	12
Water Testing	1
Wildlife Census	1
Wildlife Feeding	3
Wildlife Habitat Improvement	4

Q. General Topics Covered

Topic	No. of Schools Responding
Economics and Conservation	26
History and Conservation	26
Human Resources	28
Mineral Resources	32
Plant Resources (Including Forests)	41
Politics and Conservation	16
Recreational Resources	41
Regional Planning	13
Soil Resources	46
Urban Conservation Problems	21
Water Resources	44
Wildlife Resources	43

R. Topics with Possible Field Experiences

Topic	No. of Schools Including Classroom Instruction	No. of Schools Offering Field Experiences
Air Pollution Studies	20	0
Ecology	37	17
Forest Management	43	29
Nature Study	28	17
Physical Geography	13	5
Soil Testing	31	18
Soil Conservation Practices	46	24
Stream Improvement	30	11
Tree Planting	36	24
Tree Pruning	22	15
Water Pollution	42	8
Wildlife Management	42	11

S. Types of Written Assignments

Assignment	No. of Schools Responding
Answers to Questions	30
Book Reports	17
Field Activity Reports	23
Maps	16
Newspaper Article Summaries	21
Notebooks	24
Outlines of Reading Assignments	12
Pamphlet	19
Term Papers and/or Projects	20
Worksheets	27
Written Reports on Special Topics	32

Discussion

Examination of Table A reveals that the majority of conservation course teachers majored in agriculture education (16 teachers) or biology, either alone (9 teachers) or in combination with another field as a double major (11 teachers). Only two conservation education majors and six biology-conservation education double-majors are teaching conservation courses.

According to a January 1970 survey of Wisconsin's 455 school districts (64% return) there are at least 57 conservation education majors teaching in Wisconsin schools. Apparently only eight of these are teaching in conservation education courses, and the balance are teaching other subjects.

One cannot help but question, "Is an undergraduate major program in conservation education needed?" and "Would a double major of conservation education and another subject field be better preparation for teaching in a public high school?"

Note also from Table A that only four of the 52 conservation course teachers have substantial training in the social studies. Yet are not environmental problems largely social problems?

Study of the student data, Tables D and E, suggests some additional questions. Only 2,681 students, about 1% of the total of 296,834 in grades 9-12, receive instruction in the conservation of natural resources in a separate course. According to their teachers, the majority of these possess below average ability.

Is instruction in the conservation of natural resources important only for this group? Is it not important for all students? Where do the other 99% of Wisconsin high school students receive this instruction? The January 1970 survey referred to above suggests that about 35% of Wisconsin school districts do not have science courses of study which mention the conservation of natural resources. The same study suggests that about 45% of these districts do not have social studies courses of study which mention conservation of natural resources. Some of these schools simply do not have a written course of study, others omit reference to conservation. Is instruction in the conservation of natural resources being integrated into these or other subject areas, or is it being ignored?

An interesting discovery resulted when teachers were asked about the availability of course syllabi. Twenty-eight of the 46 schools answered that a syllabus was followed but only 14 of these were able to supply a copy upon request. Several of these 14 syllabi had a distinct lingering odor of duplicating fluid when received by the author. Three additional schools follow a text. Are these courses being taught with such a minimum of pre-planning?

The lack of course syllabi might be explained by the fact that no high school conservation textbook existed in 1968-69 which the teachers felt was satisfactory, and whether we like it or not, teachers follow textbooks. The most frequent request received by the author from conservation teachers is for recommendations concerning text materials. Only a very few high school conservation education textbooks have been written. The majority of the books listed in Table L are college level books. One wonders how high school conservation teachers justify the use of college level reading materials in a course in which most of the students possess lower than average ability.

Another interesting set of observations may be made from Tables M and R, both dealing with field activities. Note that the majority of field experiences offered conservation students are related to forestry. But even for those topics which seem to be "naturals" for field work, relatively few such opportunities are offered. One questions the wisdom of teaching about nature study, tree planting and tree pruning without field activities. But yet about a third of the teachers who said they taught these topics said they did not offer field activities!

But teachers are not always at fault when they do not offer field experiences to students. Table O lists reasons which limit the number of field trips offered to students. The two reasons cited most often were the expense involved in transporting students and conflicts in getting students released from other classes (scheduling). Should a high school course in conservation education be a "textbook-oriented" course or a "field-oriented" course?

Table Q deals with general topics covered in these courses. Note that 41 or more of the 46 responding schools include instruction in plant (forest), soil, water, wildlife and recreational resources. Only 16 consider political aspects of conservation, only 13 consider regional planning and only 21 consider urban conservation problems. Yet today 70% of the people in the United States live in urban areas, and this is expected to grow to 80% by 1980. Are not regional and urban planning essential topics for today's youth to study?

Conclusion

It appears that conservation courses as offered in Wisconsin high schools today are not meeting the challenges of today's world. It also appears that the legislation of the 1930's has not had the expected effect on conservation education. The number of students served is an extremely small part of the total student body. The topics covered most frequently are the traditional, rural oriented ones, yet as adults these students will live in a highly urbanized society.

Wisconsin high school conservation courses must meet the challenges presented to them by a deteriorating earthly environment. How might this be done? The following suggestions are offered:

1. Consider the high school course to be a capstone course to a K-12 program in environmental education, a program which integrates the teaching of environmental education concepts into all subject areas, but science and social studies in particular. The integrated program should (a) develop an understanding of the biophysical and socio-cultural environment and the problems associated with it, (b) develop an understanding of how these problems can be solved using our existing institutions and new ones if needed and (c) motivate students to act towards the solution of environmental problems.
2. Develop and teach the course as a joint offering of the science and social studies departments.
3. Center the course content around local environmental problems studied in the neighboring community whenever possible.

A course of action leading to a program like that described above would include both pre- and inservice teacher training activities, environmental education curriculum development in all disciplines, and extensive study and research into attitude development, particularly as it applies to environmental problems. Obviously this is not totally within the realm of the local school district. A statewide cooperative effort is needed.

The author suspects that the state of high school conservation courses is no worse in Wisconsin than in other parts of the country. Some courses

are very good and some are very poor. A nation-wide effort to improve instruction in environmental education or, if you prefer, the conservation education, at all levels, K-12, is needed.